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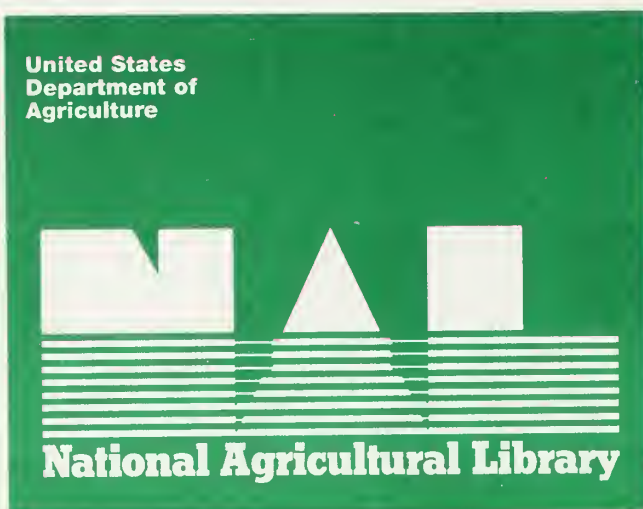
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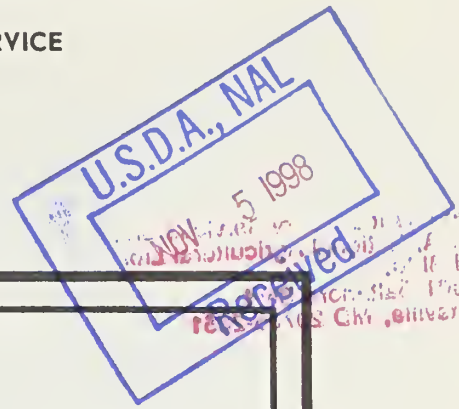


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1951

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL MARKETING SERVICE

Washington, D. C.



UNITED STATES
STANDARDS

for grades of

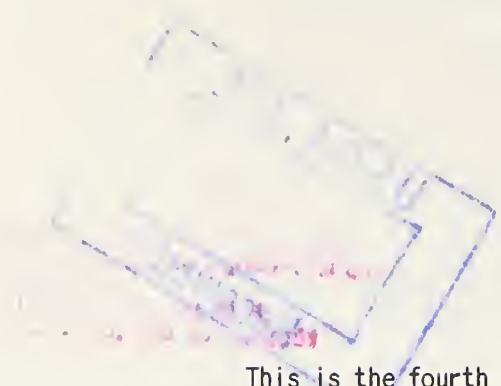
EXTRACTED HONEY



EFFECTIVE APRIL 16, 1951

Fourth Issue

These standards supersede the standards
which have been in effect since
March 15, 1943



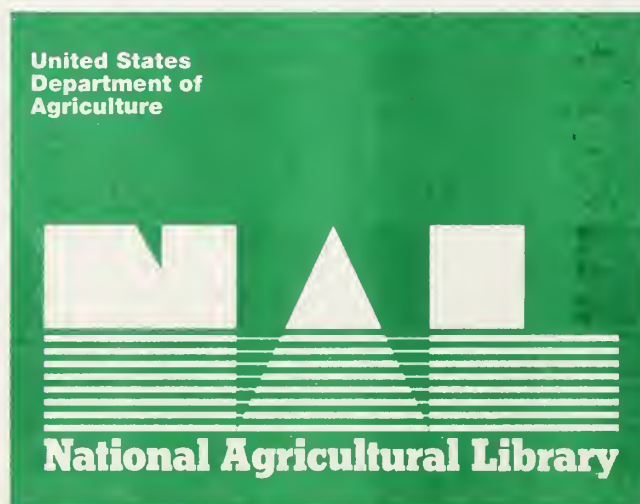
This is the fourth issue of the United States Standards for Grades of Extracted Honey. These standards are issued by the Department after careful consideration of all data and views submitted.

These standards were published in the Federal Register of March 16, 1951 (16 F. R. 2463) and recodified in the Federal Register of December 9, 1953 (18 F. R. 8005) -- Section 52.1403 was amended (22 F. R. 3535) to become effective July 1, 1957.

As in the case of other standards for processed fruits and vegetables, these standards are designed to serve as a convenient basis for sales, for establishing quality control programs, and for determining loan values. They will also serve as a basis for the inspection of this commodity by Federal inspection service, which is available for the inspection of other processed products as well.

The Department welcomes suggestions which might aid in improving these standards in future revisions. Comments may be submitted to, and copies of these standards obtained from:

Chief, Processed Products Standardization
and Inspection Branch
Fruit and Vegetable Division
Agricultural Marketing Service
United States Department of Agriculture
Washington 25, D. C.



UNITED STATES STANDARDS FOR GRADES OF EXTRACTED HONEY ¹

Effective April 16, 1951

PRODUCT DESCRIPTION, TYPES, TYPES OF PROCESS, AND COLOR

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- 52.1392 Types of extracted honey.
- 52.1393 Color of honey.
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PRODUCT DESCRIPTION, TYPES, TYPES OF PROCESS, AND COLOR

§ 52.1391 *Product description.* "Extracted honey" or "honey" is honey that has been separated from the comb by centrifugal force, gravity, straining, or by other means, and is prepared and packed under sanitary conditions in accordance with good commercial practice.

¹ The requirements of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

§ 52.1392 *Types of extracted honey.*

The type of extracted honey is not incorporated in the grades of the finished product since the type of extracted honey, as such, is dependent upon the method of preparation and processing, and therefore is not a factor of quality for the purpose of these grades. Extracted honey may be prepared and processed as one of the following types:

(a) *Liquid honey.* "Liquid honey" is honey that is free from visible crystals.

(b) *Crystallized honey.* "Crystallized honey" is honey that is solidly granulated or crystallized, irrespective of whether "Candied," "Fondant," "Creamed," or "Spread" types of crystallized honey.

(c) *Partially crystallized honey.* "Partially crystallized honey" is honey that is a mixture of liquid honey and crystallized honey.

§ 52.1393 *Color of honey.* The color of honey is not a factor of quality for the purpose of these grades.

(a) The color classification of honey is determined by means of the U. S. D. A. permanent glass color standards for honey.²

(b) The respective color designation, applicable range of each color, and color range on the Pfund scale are shown in Table No. I, together with spectrophotometric specifications for freshly prepared caramel-glycerine solutions which in thickness of 3.15 centimeters (1.24 inch)

² An approximate color classification may be made by means of the Pfund color grader and the color designated in terms of the aforesaid U. S. D. A. color standards.

closely match the colors of the U. S. D. A. permanent glass color standards.

(c) Crystallized honey and partially crystallized honey are liquefied by heating to approximately 54.4° C. (130° F.) and cooled to approximately 20° C. (68° F.) before ascertaining the color of the honey by means of the U. S. D. A. permanent glass color standards for honey.

§ 52.1394 *Application of U. S. D. A. permanent glass color standards in classifying the color of honey*—(a) *Sample containers.* The sample containers for use in making the visual color determination as set forth in § 52.1395 are square bottles of colorless transparent glass, having an internal width at the center of 3.15 centimeters (1.24 inch), with outside base dimensions of approximately 1⁷/₁₆ inches by 1⁷/₁₆ inches, and having a capacity of approximately 2 ounces.

(b) *Comparator; viewing box.* Two comparators or viewing boxes are required for the entire color range in the visual comparison test. Each comparator is divided into five compartments approximately 1¹/₂ inches square, with each compartment provided with openings approximately 1³/₁₆ inches square in the two parallel sides. The U. S. D. A. permanent glass color standards are mounted in a fixed position in the front openings of compartments 1, 3, and 5 of the two comparators, compartments 2 and 4 being adapted to receive the sample containers.

(c) *Clear blanks.* Six clear blanks of distilled water in capped sample containers are required. The clear blanks are placed in the compartments provided behind each permanent glass color standard.

(d) *Cloudy suspensions.* Three cloudy suspensions of bentonite in distilled water, each in a capped sample container, are required. These are referred to as "Cloudy No. 1," "Cloudy No. 2," and "Cloudy No. 3," corresponding to varying degrees of cloudiness within the range of the different grades of honey. The cloudy suspensions replace the clear blanks when cloudy honey is to be classified for color.

(e) *Visual comparison test.* The color of a sample of honey is compared with the U. S. D. A. permanent glass color standards in the following manner to determine its color classification:

(1) Place the sample of honey in a clean dry sample container.

(2) Place the clear blanks behind each permanent glass color standard.

(3) Place the container filled with the sample of honey successively in compartments 2 and 4 of the comparator, and visually compare the color of the sample with that of each of the glass color standards by looking through them at a diffuse source of natural or artificial daylight. The color is classified in accordance with the color range as given in Table No. I.

TABLE NO. I.—COLOR DESIGNATION OF HONEY AND RANGE FOR EACH COLOR

| U. S. D. A. color standards | Color range U. S. D. A. color standards | Color range Pfund scales | Optical density ¹ |
|-----------------------------|---|-------------------------------|------------------------------|
| | | <i>Millimeters</i> | |
| Water White..... | Honey that is Water White or lighter in color than Water White Color Standard. | 8 or less..... | 0.0945 |
| Extra White..... | Honey that is darker than Water White but not darker than Extra White Color Standard. | Over 8 to and including 17. | .189 |
| White..... | Honey that is darker than Extra White but not darker than White Color Standard. | Over 17 to and including 34. | .378 |
| Extra Light Amber.... | Honey that is darker than White but not darker than Extra Light Amber or Golden Color Standard. | Over 34 to and including 50. | .595 |
| Light Amber..... | Honey that is darker than Extra Light Amber but not darker than Light Amber Color Standard. | Over 50 to and including 85. | 1.389 |
| Amber..... | Honey that is darker than Light Amber but not darker than Amber Color Standard. | Over 85 to and including 114. | 3.008 |
| Dark Amber..... | Honey that is darker than Amber Color Standard... | Over 114..... | ----- |

¹ Optical density (absorbance) = log₁₀ (100/percent transmittance), at 560 mμ for 3.15 centimeter thickness for caramel-glycerin solutions measured versus an equal cell containing glycerin.

(4) If the sample is appreciably cloudy in appearance, the clear blanks are replaced by the cloudy suspensions, "Cloudy No. 1," "Cloudy No. 2," or "Cloudy No. 3," respectively, to facilitate color classification.

§ 52.1395 *Tolerance for certification of color of officially drawn samples.* When certifying the color of samples that have been officially drawn and which represent a specific lot of honey, the lot shall be considered as of one color if not more than one-sixth of the containers comprising the sample contains honey of a different color: *Provided, however,* that the honey in none of the containers falls below the next darker color designation.

FILL OF CONTAINER

§ 52.1396 *Recommended fill of container.* The recommended fill of container is not incorporated in the grades of the finished product since fill of container, as such, is not a factor of quality for the purpose of these grades. It is recommended that each container be filled with honey as full as practicable, and with respect to containers of one gallon or less the honey shall occupy not less than 95 percent of the total capacity of the container.

GRADES

§ 52.1397 *Grades of honey.* (a) "U. S. Grade A" or "U. S. Fancy" is the quality of honey that contains not less than 81.4 percent soluble solids,³ possesses a good flavor for the predominant floral source or, when blended, a good flavor for the blend of floral sources, is free from defects, and is of such quality with respect to clarity as to score not less than 90 points when scored in accordance with the scoring system outlined in this subpart.

(b) "U. S. Grade B" or "U. S. Choice" is the quality of honey that contains not less than 81.4 percent soluble solids,³ possesses a reasonably good flavor for

the predominant floral source or, when blended, a reasonably good flavor for the blend of floral sources, is reasonably free from defects, is reasonably clear, and scores not less than 80 points when scored in accordance with the scoring system outlined in this subpart.

(c) "U. S. Grade C" or "U. S. Standard" is honey for reprocessing that contains not less than 80 percent soluble solids,³ possesses a fairly good flavor for the predominant floral source or, when blended, a fairly good flavor for the blend of floral sources, is fairly free from defects, and is of such quality with respect to clarity as to score not less than 70 points when scored in accordance with the scoring system outlined in this subpart.

(d) "U. S. Grade D" or "Substandard" is the quality of honey that fails to meet the requirements of "U. S. Grade C" or "U. S. Standard."

FACTORS OF QUALITY

§ 52.1398 *Ascertaining the grade.* (a) The grade of honey may be ascertained by considering in conjunction with the requirements of the various grades the respective ratings for the factors of flavor, absence of defects, and clarity.

(b) The soluble solids content of honey may be determined by means of the refractometer at 20° C. (68° F.). The refractive indices and corresponding percent soluble solids and equivalent specific gravity and percent of moisture may be ascertained from Table No. II of this section. The soluble solids content of honey and equivalent values may be determined by any other method which gives equivalent results.

(c) The relative importance of each factor is expressed numerically on the scale of 100. The maximum number of points that may be given each factor is:

| Factors: | Points |
|-------------------------|--------|
| Flavor----- | 50 |
| Absence of defects----- | 40 |
| Clarity----- | 10 |

Total score----- 100

(d) Crystallized honey and partially crystallized honey shall be liquefied by

³ Percent moisture and other equivalents may be ascertained from Table No. II of this section.

heating to approximately 54.4° C. (130° F.) and cooled to approximately 20° C. (68° F.) before ascertaining the grade of the product.

§ 52.1399 *Ascertaining the rating for each factor.* The essential variations within each factor are so described that the value may be ascertained for each factor and expressed numerically. The numerical range for the rating of each factor is inclusive (for example, "27 to 30 points" means 27, 28, 29, or 30 points).

§ 52.1400 *Flavor*—(a) *General.* The factor of flavor refers to the prominence of the honey flavor and aroma and to its conformity to the flavor and aroma of the predominant floral source or blend of floral sources.

(b) (A) *classification.* Honey that possesses a good flavor for the predominant floral source may be given a score of 45 to 50 points. "Good flavor for the predominant floral source" means that the product has a good, normal flavor and aroma for the predominant floral source or, when blended, a good flavor for the blend of floral sources and that the honey is free from caramelized flavor or objectionable flavor caused by fermentation, smoke, chemicals or other causes with the exception of the predominant floral source.

(c) (B) *classification.* If the honey possesses a reasonably good flavor for the predominant floral source, a score of 40 to 44 points may be given. Honey that falls into this classification shall not be graded above "U. S. Grade B" or "U. S. Choice" regardless of the total score for the product (this is a limiting rule). "Reasonably good flavor for the predominant floral source" means that the product has a reasonably good, normal flavor and aroma for the predominant floral source or, when blended, a reasonably good flavor for the blend of floral sources and that the honey is practically free from caramelized flavor and is free from objectionable flavor caused by fermentation, smoke chemicals or other causes with the exception of the predominant floral source.

(d) (C) *classification.* Honey that possesses a fairly good flavor for the predominant floral source may be given a score of 35 to 39 points. Honey that falls into this classification shall not be graded above "U. S. Grade C" or "U. S. Standard" regardless of the total score for the product (this is a limiting rule). "Fairly good flavor for the predominant floral source" means that the product has a fairly good, normal flavor and aroma for the predominant floral source or, when blended, a fairly good flavor for the blend of floral sources and that the honey may possess a slightly caramelized flavor, is free from objectionable flavor caused by fermentation, smoke, chemicals or other causes with the exception of the predominant floral source.

(e) (SStd) *classification.* Honey that fails to meet the requirements of paragraph (d) of this section or is off flavor for any reason may be given a score of 0 to 34 points and shall not be graded above "U. S. Grade D" or "Substandard" regardless of the total score for the product (this is a limiting rule).

§ 52.1401 *Absence of defects*—(a) *General.* The factor of absence of defects refers to the degree of cleanliness and to the degree of freedom from particles of comb, propolis, or other defects which may be in suspension or deposited as sediment in the container.

(b) (A) *classification.* Honey that is free from defects may be given a score of 37 to 40 points. "Free from defects" means that the honey contains no defects that affect the appearance or edibility of the product, and shall be at least as free from defects as honey that has been strained through a standard No. 80 sieve, at a temperature of not more than 130° F.

(c) (B) *classification.* If the honey is reasonably free from defects a score of 34 to 36 points may be given. Honey that falls into this classification shall not be graded above "U. S. Grade B" or "U. S. Choice" regardless of the total score for the product (this is a limiting rule). "Reasonably free from defects" means that the honey may contain defects which do not materially affect the appearance or edibility of the product,

and shall be at least as free from defects as honey that has been strained through a standard No. 50 sieve, at a temperature of not more than 130° F.

(d) (C) *classification*. Honey that is fairly free from defects may be given a score of 31 to 33 points. Honey that falls into this classification shall not be graded above "U. S. Grade C" or "U. S. Standard" regardless of the total score for the product (this is a limiting rule). "Fairly free from defects" means that the honey may contain defects which may be noticeable but shall be at least as free from defects as honey that has been strained through a standard No. 18 sieve, at a temperature of not more than 130° F.

(e) (SStd) *classification*. Honey that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 30 points and shall not be graded above "U. S. Grade D" or "Sub-standard" regardless of the total score for the product (this is a limiting rule).

§ 52.1402 *Clarity*—(a) *General*. The factor of clarity has reference to the degree of freedom from air bubbles, pollen grains, or fine particles of any material which might be suspended in the product.

(b) (A) *classification*. Honey that is clear may be given a score of 8 to 10 points. "Clear" means that the honey

may contain air bubbles which do not materially affect the appearance of the product and may contain a trace of pollen grains or other finely divided particles of suspended material which does not affect the appearance of the product.

(c) (B) *classification*. If the honey is reasonably clear a score of 6 or 7 points may be given. "Reasonably clear" means that the honey may contain air bubbles, pollen grains, or other finely divided particles of suspended material which do not materially affect the appearance of the product.

(d) (C) *classification*. Honey that is fairly clear may be given a score of 4 or 5 points. Honey that falls into this classification shall not be graded above "U. S. Grade C" or "U. S. Standard" regardless of the total score for the product (this is a limiting rule). "Fairly clear" means that the appearance of the honey may be materially but not seriously affected by the presence of air bubbles, pollen grains, or other finely divided particles of suspended material.

(e) (SStd) *classification*. Honey that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 3 points and shall not be graded above "U. S. Grade C" or "U. S. Standard" regardless of the total score for the product (this is a limiting rule)



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TABLE NO. II—REFRACTIVE INDICES AND CORRESPONDING PERCENT SOLUBLE SOLIDS, EQUIVALENT SPECIFIC GRAVITY AND PERCENT MOISTURE IN EXTRACTED HONEY ¹

| Refractive index at 20° C. | Soluble solids (percent) | Specific gravity (20°/20° C.) at 20° C. | Moisture (percent) |
|----------------------------|--------------------------|---|--------------------|
| 1.4844..... | 79.0 | 1.3966 | 21.0 |
| 1.4849..... | 79.2 | 1.3979 | 20.8 |
| 1.4853..... | 79.4 | 1.3992 | 20.6 |
| 1.4858..... | 79.6 | 1.4006 | 20.4 |
| 1.4862..... | 79.8 | 1.4020 | 20.2 |
| 1.4866..... | 80.0 | 1.4033 | 20.0 |
| 1.4871..... | 80.2 | 1.4046 | 19.8 |
| 1.4876..... | 80.4 | 1.4060 | 19.6 |
| 1.4880..... | 80.6 | 1.4074 | 19.4 |
| 1.4885..... | 80.8 | 1.4087 | 19.2 |
| 1.4890..... | 81.0 | 1.4101 | 19.0 |
| 1.4895..... | 81.2 | 1.4115 | 18.8 |
| 1.4900..... | 81.4 | 1.4129 | 18.6 |
| 1.4905..... | 81.6 | 1.4143 | 18.4 |
| 1.4910..... | 81.8 | 1.4156 | 18.2 |
| 1.4915..... | 82.0 | 1.4171 | 18.0 |
| 1.4920..... | 82.2 | 1.4184 | 17.8 |
| 1.4925..... | 82.4 | 1.4197 | 17.6 |
| 1.4930..... | 82.6 | 1.4212 | 17.4 |
| 1.4935..... | 82.8 | 1.4225 | 17.2 |
| 1.4940..... | 83.0 | 1.4239 | 17.0 |
| 1.4945..... | 83.2 | 1.4254 | 16.8 |
| 1.4950..... | 83.4 | 1.4267 | 16.6 |
| 1.4955..... | 83.6 | 1.4282 | 16.4 |
| 1.4960..... | 83.8 | 1.4295 | 16.2 |
| 1.4965..... | 84.0 | 1.4310 | 16.0 |
| 1.4970..... | 84.2 | 1.4324 | 15.8 |
| 1.4975..... | 84.4 | 1.4338 | 15.6 |
| 1.4980..... | 84.6 | 1.4352 | 15.4 |
| 1.4985..... | 84.8 | 1.4367 | 15.2 |
| 1.4990..... | 85.0 | 1.4381 | 15.0 |
| 1.4995..... | 85.2 | 1.4395 | 14.8 |
| 1.5000..... | 85.4 | 1.4409 | 14.6 |
| 1.5005..... | 85.6 | 1.4424 | 14.4 |
| 1.5010..... | 85.8 | 1.4438 | 14.2 |
| 1.5015..... | 86.0 | 1.4453 | 14.0 |
| 1.5020..... | 86.2 | 1.4466 | 13.8 |
| 1.5025..... | 86.4 | 1.4481 | 13.6 |
| 1.5030..... | 86.6 | 1.4495 | 13.4 |
| 1.5035..... | 86.8 | 1.4510 | 13.2 |
| 1.5041..... | 87.0 | 1.4525 | 13.0 |

¹ Temperature corrections: If refractometer reading is made at temperatures above 20° C. (68° F.), add 0.00023 to the refractive index for each degree C., or 0.00013 for each degree F. If made below 20° C. (68° F.), subtract correction. The moisture content of honey and equivalent values may be determined by any other method which gives equivalent results.

LOT INSPECTION AND CERTIFICATION

§ 52.1403 *Ascertaining the grade of a lot.* The grade of a lot of extracted honey covered by these standards is determined by the procedures set forth in the Regulations Governing Inspection and Certification of Processed Fruits and Vegetables, Processed Products Thereof, and Certain Other Processed Food Products (§§ 52.1 through 52.87; 22 F. R. 3535).

SCORE SHEET

§ 52.1404 *Score sheet for extracted honey.*

| | |
|--|-------|
| Size and kind of container..... | ----- |
| Container mark or identification..... | ----- |
| Label..... | ----- |
| Net weight (ounces)..... | ----- |
| Type (liquid, crystallized or partially crystallized)..... | ----- |
| Soluble solids (percent)..... | ----- |
| Moisture (percent)..... | ----- |
| Specific gravity..... | ----- |

| Factors | | Score points |
|-------------------------|-----|--|
| Flavor..... | 50 | { (A) 45-50 (B) 40-44 (C) 35-39 (D) 30-34 |
| Absence of defects..... | 40 | { (A) 37-40 (B) 34-36 (C) 31-33 (D) 28-30 |
| Clarity..... | 10 | { (A) 8-10 (B) 6-7 (C) 4-5 (D) 1-3 |
| Total score..... | 100 | |

| | |
|-------------------------------|-------|
| Grade..... | ----- |
| Color..... | ----- |
| Floral source or sources..... | ----- |

¹ Indicates limiting rule.

*Recodified in the Federal Register of December 9, 1953 (18 F. R. 8005)
Section 52.1403 amended May 22, 1957 (22 F. R. 3535)*

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